

SEMICONDUCTOR DEVICE AND ITS MANUFACTURING METHOD

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Abstract

PROBLEM TO BE SOLVED: To provide a barrier layer very effective for preventing diffusion of water and/or oxygen which is easily and reliably manufactured in an integrated circuit device including a copper structure.

SOLUTION: In an integrated circuit, a diffusion barrier layer 18 made of a high density material for protecting a copper structure 40 from oxidation in the presence of oxygen or water being apt to bring about defects such as pin-holes is modified on site by oxidation of a material self-restrictively capable of making a protective oxide. This material is provided in contact with the high-density material preferably as a film 26. The protection for the copper structure 40 allows a high-conductivity copper to be used, combined with a known low-dielectric constant (low-k) material resistive to diffusion of oxygen and water.

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